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Special report: Highways and the environment

Wisconsin NATURAL RESOURCES

September/October 1985 • Volume 9, Number 5

Milkweed

Madison's Beltline

Hidden Caves

Climate: hot or cold?

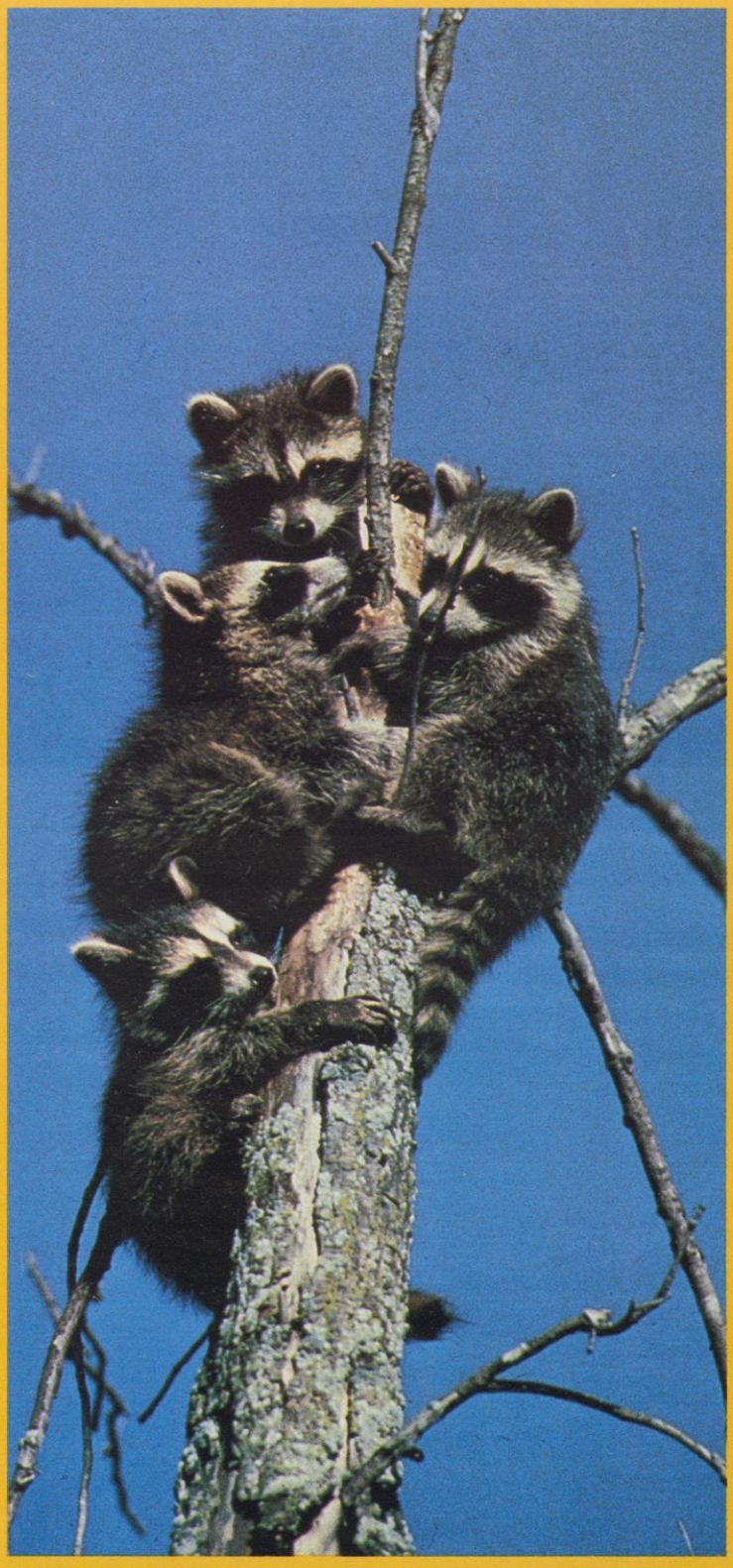

Photo by Herb Lange

Front cover:
Ripe to bursting under the summer sun—
a common milkweed pod.
Photo by Al Hillery

RACCOONS

***R**emarkable*
***A**udacious*
***C**harming*
***C**lever*
***O**pportunistic*
***O**mnivorous*
***N**oisy*
***S**killful*

JERRY MOSSER UW-Extension

Raccoons decline in popularity at this time of year. Their midnight raids on home vegetable gardens, campsites and an occasional chicken house can try the patience of even the most enthusiastic wildlife lover. Three factors figure prominently in raccoons' run-ins with people: proximity, abundance and remarkable natural abilities.

Usually, raccoons make their homes in hollow hardwood trees, fallen logs and other woodland sites. But, they also take up residence in manmade structures: seldom used buildings and haymows on farms, storm sewers and attics in towns and cities.

Raccoons are clever, curious creatures. According to laboratory animal intelligence tests, raccoons are considerably smarter than cats, but not as smart as monkeys. Intelligence and forefeet that function almost as well as human hands enable raccoons to pull out corks, take off bottle tops, turn knobs and open latches.

Despite their depredations, raccoons have a time-honored place among North American wildlife. Indians valued them for food and fur. European settlers also ate coon meat and wore coon skins. Today, raccoons are hunted and trapped and raccoon pelts are still important in the fur trade.

By ancestry, raccoons are carnivores. Along with bears, they split off from the ancient lineage of meat eaters that led to today's dogs. By diet, however, raccoons are omnivores. Besides meat, they eat grain, nuts, fruit and tender young plants. Although raccoons have a reputation for washing their food, what looks like washing is actually part of their hunt. By dunking food in water, raccoons are better able to examine it.

Raccoons eat crayfish, earthworms, frogs, tadpoles, insects, fish, turtles, mussels and clams. Wild produce is fine, and so are cultivated fruits and vegetables. Nothing tops sweet corn. Raccoon-plagued modern gardeners may take some consolation in knowing that early settlers complained of raccoons raiding their cornfields. Presumably, Indians also had to contend with coons in the corn.

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It was recently learned that raccoons can transmit a lethal parasitic roundworm to humans. If *Baylisascaris procyonis,* eggs are ingested, the roundworm invades the brain or eyes of its victim. Several cases of death or blindness have been reported in infected persons. The eggs, carried by raccoons on their fur or in their feces, are long-lived and can survive up to 12 years through summer heat and winter freeze. Studies show that 70% of adult raccoons and 90% of young ones carry the dangerous parasite. People who keep the animals as pets are especially threatened. Parents should be careful where they let children play if raccoons are around.

Raccoons become sexually mature at one year of age. The annual mating season normally lasts from January till mid-March. Litters averaging four coons are born in April or May. The young are weaned at 10 to 12 weeks of age but remain with the mother well into autumn, some until she mates again. Raccoons' normal life span in nature is five to six years.

And raccoons are noisy animals. Their main call, or "song," is a tremulous whistle—loud, harsh and high pitched. When angry, raccoons snarl, growl and hiss. When frightened or hurt, they make loud, rasping, piercing screams. Raccoons feeding as a family group often seem to make small talk—grunting and churring.

Sometimes infuriating, sometimes fascinating, raccoons are always nearby, sharing our environment—and our food.

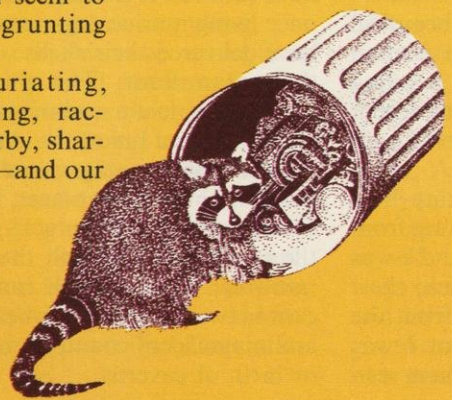

Illustration courtesy of UW-Extension

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Green Bay's Wild Caves

The author descends into Flowstone Crevice Cave.

NORBERT H. KOX, Suring

If you crawl through a 10-inch squeezeway in a block creep cave, you're likely to see a rimstone dam—or maybe a bunch of skeletons.

Illustrations and photos by author

It was November 15, 1984. I lay stretched out on my side in a shallow pool of frigid water, shivering as the cold stone clutched at my body. Retreat from the cave was one inch at a time. I backed feet-first out of a ten-inch-wide squeezeway, which gradually stripped off my clothes. My pantlegs tugged upward exposing my legs, and my torn shirt was riding up over my head. The enclosing walls were like ominous jaws whose cold, sharp teeth gnawed at my unprotected body and ate bits of flesh from my stomach and back. As I leaned hard on one elbow, I could feel my skin scrape raw on the razor sharp gours of the cave floor.

I had become an intruder, and this beautiful virgin cave, never before entered by a human being, showed a demeanor definitely tending toward the unfriendly. It was not going to accept my presence nor allow me to escape without vengeance.

When I finally emerged from that tiny hole connecting the two worlds, my clothes hung from my body in tatters, my ribs were sore, and I was chilled through. My body ached. My back, chest and arms were covered with scratches from the sharp calcite fangs in the cave wall. But I was happy. I was the first man on earth to have seen the Miniature Mammoth Room in Flowstone Crevice Cave.

Flowstone Crevice, discovered October 16, 1984, is part of the Green Bay Cave System, which was virtually unknown until spelunkers exploring "The Ridge" in 1983 found Kox cave and several smaller ones. The system is situated in the Niagara Escarpment, which extends from Niagara Falls under the Great Lakes and resurfaces in northeastern Wisconsin. Where its dolomite protrudes northwest of Green Bay, it is known locally as The Ridge.

Dolomite is limestone that has a high magnesium content. It is the product of billions of tiny, once living marine organisms which, upon death, have delivered their shells or minute skeletons to the ocean floor. The thick ooze, composed mostly of calcium and magnesium, gradually became a type of limestone. As the earth underwent various chaotic stages, prehistoric ocean floors heaved upward in places, becoming dry land. This process formed cracks and pockets between the strata, and through the dissolving action of rainwater charged with carbonic acid, insignificant networks of fissures became interlacing halls and magnificent chambers in the "speleogenesis" or birth of caverns.

During the Ice Age 10,000 to 20,000 years ago, glaciers cut into the land, plowing and gouging, moving both earth and rock. Many "solution" caverns created by the solvent action of underground water had already been formed. The glacial action opened some and closed others. It also simultaneously created different types of caves: the block creep cave formed by cracking and "creeping" of rock; the talus cave which consists of pockets beneath erratically piled breakdown blocks; and the various cracks or lines of fault that occurred when the glacier sheared off rock faces to form escarpments.

Thus far, all the caves discovered within the Green Bay System have been block creep caverns. My personal files record 27 locations in a seven mile area. Many others remain concealed. Some of the caves show evidence of solution. Solution caves are also present elsewhere in the escarpment — which runs north the full length of the Door County Peninsula and southward through De Pere, then on to High Cliff Park at Lake Winnebago. Tecumseh is the longest natural cave in the state of Wisconsin, 2,000 feet. Paradise Pit, 1,780 feet, is the second longest.

Kox Cave, which is entered vertically through a twelve-inch opening, is a series of enlarged vertical joints which can be penetrated to a depth of 34 feet and a length of nearly 150 feet. The cave displays a variety of formations or speleothems which include various dripstones, some milky flowstone and also carolloid. Carrolloid is sometimes called cave coral or popcorn and consists of clusters of rounded knobs of calcium carbonate. There is also boxwork or honeycomb and a small rimstone dam in the active section. Spelunkers refer to the northern portion of Kox Cave as being dead, which means that its speleothems are no longer moist and enlarging. This portion contains a blanket of travertine (layered calcium carbonate) draped over the entire west wall. In addition, some crystalline formation is present in the connecting passage between the north and south rooms.

Cave spiders are among the permanent residents, and bats have been seen in the lower passage. During excavation in the south room of Kox Cave, bones and skulls were retrieved from the floor beneath about six feet of breakdown and sediment. They were animal remains, identified by Dr. Richard Stiehl, former UW-Green Bay mammalogist, as the skeletons of mice, fox, rabbits, dog, deer, beaver and a groundhog.

Some of the more accessible caves in the area may have been used by local Indians, but no human relics or artifacts have yet been recovered. Archeological excavation is being conducted at Big Mouth Cave which is located in the side of a 25-foot high bluff and extends inward 44 feet. It has an average ceiling height of seven feet and a six by six foot entrance. Nearby above ground, archeologists have found Indian villages, gardens and even a battlefield. Another smaller tri-level cave, Indian Trail Cave is also a likely candidate for prehistoric human use.

On a recent trip to Big Mouth Cave, I momentarily removed my headgear, spun around and struck the top of my skull on a sharp rock creating a deep gash. As the blood trickled down my forehead, it reaffirmed the importance of a safety helmet to a spelunker.

During a very brief cave hunt October 16, 1984, I had discovered three new caves: A-Cave, Hole, and Flowstone Crevice Cave, as they were later named. The entrance to Flowstone Crevice was a mere 12 x 24 inches. Peering into the small opening, I could see thick draping flowstone or travertine to the immediate north. My heart said "enter," but my brain said "get someone to accompany you." It is a dangerous situation to enter a cave alone, especially if no one knows where you are.

The following day my son Jeremy and I returned to explore and begin mapping the Flowstone Crevice. We encountered a vast quantity and variety of flowstone, and several rimstone dams which held back small pools of water. The two upper squeezeways were entered to the extent possible, but an unbelieveable find halted our exploration of the lower passage. Literally thousands of bones were scattered there like pick-up-sticks the full length of the corridor.

My back, chest and arms were covered with scratches from the sharp calcite fangs in the cave wall. But I was happy. I was the first man on earth to have seen the Miniature Mammoth Room in Flowstone Crevice Cave.

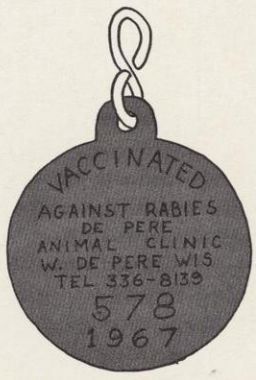
Skulls were piled on top of each other, and jawbones with sharp teeth were visible throughout the mass.

Not wishing to damage any of the relics, we postponed further exploration until a future date.

On November 12, 1984, photography and removal of the remains began. The bones were placed in numbered bags for future identification. As the skeletons were gathered from the surface of the floor, to a depth of about four inches, boards were placed down to avoid sinking into the sediment and causing extensive damage to any remaining bones.

Seven dog collars were retrieved from this section of the cave, now called Dead Dog Chamber. As the end of this passage was approached, more cave could be seen beyond, but some tricky maneuvers would be necessary to negotiate the remainder of the cave.

A nine-inch squeeze leads down into Dead Dog Chamber, which is an easy hands-and-knees crawl. At the end of this chamber, Thin Man's Canyon is encountered. It was necessary to face the east wall in this 12-inch-wide canyon, pull myself up toward the ceiling and squeeze sideways over a large block in the passage. Stalactites and helictites (twig-like projections of calcite) begin to appear at this point, some sharp, like teeth in a great stone jaw.



A dog tag was found among the cave relics.

Within a short distance, the eight-foot-tall canyon is constricted by a hill which reaches within two feet of the ceiling, where stalactites hang like icicles and glassy stalagmites protrude from the cave floor. Here, I found it essential to rotate and face the northwest wall for the remaining squeeze.

The excitement mounted as the sound of dripping water reached my ears. What was in store for me around the next curve? It was difficult moving in the ten-inch-wide squeezeway, and as I inched along on my side across the jagged floor, my heart raced with eagerness. I could see where the water was trickling down a series of rimstone dams and disappearing beneath the wall. Just inches from my face were several oolites (cave pearls), the first I had ever seen. Ahead of me was a larger dam holding back about six inches of water. Several stalactites up to four inches long and a thick four-inch helictite could be seen.

Rather than push any further and chance destroying the formations on the floor, I decided to try to negotiate the upper portion of the passage but could not squeeze into it at this point. With great difficulty, I backed up about 10 feet to where a nine-inch squeeze made the upper section penetrable. I had a twelve-inch-long wonder-bar in my right hand, which enabled me to push against the floor to avoid sliding downward and becoming wedged in the crevice. On a successive trip, a nine-inch stick was used to avoid damaging speleothems, hence the name "Broomstick Squeeze."

I squeezed and pushed almost beyond reason, feeling that I just could not retreat without first catching a glimpse of the corridor above the underground mini-lake, dubbed the "Swimming Pool." I had to contort and twist, and crane my neck, but suddenly I saw it: a beautiful glistening room that, except for its size, looked like it might be part of Mammoth Cave in Kentucky. The west wall of this highly ornamented chamber displayed a beautiful milky white flowstone in a frozen Niagara style. Several impressive-looking stalactites of a dark purple hue hung in place, and the east wall supported draping masses of red and black Aztec or Mexican onyx (named for its use by the Aztecs who carved idols and masks from it).

This magnificent sight made the whole ordeal, including the agonizing exit, worthwhile — and the throbbing pain in my muscles was now being endured for a reason. Although the prehistoric subterranean sanctuary had been a bit hostile toward its first human visitor, I did not let it discourage me. The cave is worth viewing again and again.

I could not see beyond the Miniature Mammoth Room, and further penetration would have meant the possible destruction of speleothems which take hundreds of years to form. So, being an ecologically minded caver, this was my cue to exit.

Unfortunately, formations in many caves have been inadvertently damaged, while others have sometimes been maliciously vandalized. For these reasons, the exact locations of caves are usually kept relatively secret, divulged only to serious-minded spelunkers, archeologists or other scientific and conservation oriented personnel.

On December 14, 1984, the bones from Flowstone Crevice Cave were taken to the UW-Green Bay for identification by mammalogist Dr. Robert W. Howe, and the Assistant Curator of the Richter Natural History Collection, Tom Erdman. A total of 61 pounds of bones have thus far been removed from the cave, including opossum, squirrel, raccoon, cats, dogs and a possible coyote or hybrid.

Both men were amazed at the multitude of dogs and cats that had perished in the cave. Nineteen dog skulls and many fragmentations were found along with a great number of lower jaw bones that, when pieced together like a jigsaw puzzle, constitute the remains of 41 individual dogs. The cat remains represent 21 cats. Including other animals, the combined number of individual skeletons removed from the cave to date is 66.

Why would so many animals allow themselves to fall into the hole? A squirrel could certainly climb out, and so might a cat. They must have entered while alive, for if someone had simply cast in animal carcasses the bones would have heaped up in the entrance and would not have been found 30 feet into the cave. Perhaps a dog would chase a cat or other animal into the cave, kill it and then find that it too was doomed by the insurmountable vertical shaft that led to freedom.

I had to contort and twist, and crane my neck, but suddenly I saw it: a beautiful glistening room that, except for its size, looked like it might be part of Mammoth Cave in Kentucky.

Another possibility might be that some demented madman was casting the poor wretched animals alive into the pit to suffer an agonizing death.

No mouse skeletons have been found in Flowstone Crevice, but evidently they have access in and out. Their gnaw marks are found in some of the bones, which Tom Erdman said mice eat for calcium.

We have not discovered any prehistoric or extinct relics, but in a cave elsewhere in the state, an extinct canine, *Platygonus compressus,* was found in 1968. Perhaps one of our digs will someday yield an extinct specimen. Or we might happen onto a tundra species like the arctic ground squirrel, collard lemming or yellow-cheeked vole, which were discovered in the caves of northeastern Iowa.

Incidentally, the Flowstone Crevice Cave pit entrance has been fitted with a cover to prevent any more animals from falling into it in the future.

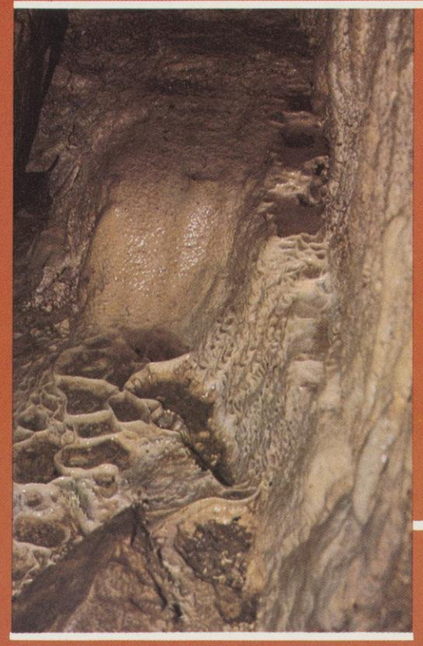
Red and black onyx in the Miniature Mammoth Room. The ancient Aztecs made carvings from similar stone.

If you are adventurous and wish to have your own taste of spelunking, you may want to obtain soil maps which show locations of rock outcrops in limestone-dolomite areas and begin your own search for wild caves (non-commercial). Fall, winter and early spring are excellent times to do it since foliage is minimal and cave openings are more readily visible. In winter, the snow melts from around the vertical openings, and when proper conditions ensue, steam can be seen arising. Horizontal entrances are sometimes found, but many are vertical through a sinkhole or collapsed cave roof. Very few areas have a high concentration of caves, so do not allow yourself to become easily discouraged.

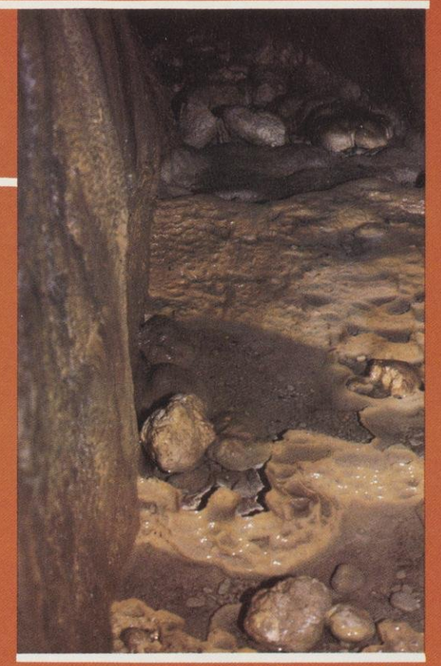
Good books on caving can be obtained through your public library, or you may wish to contact the National Speleological Society, Cave Ave., Huntsville, AL 35810. You may also want to join a local grotto. In our state, it's the Wisconsin Speleological Society (WSS), c/o Wisconsin Geological and Natural History Survey, 3817 Mineral Point Rd., Madison, WI 53705. Wisconsin cave discoveries should be reported, along with a description of the cave and its location, to Jim Gilbertson, WSS President, 2767 Hope Rd., Cottage Grove, WI 53527.

Persons in the Suring and Green Bay areas interested in caving or who know of northeastern Wisconsin caves, sinkholes or crevices believed to be uncharted, should write the author at Cave Hunters, Route 1, Box 284-A, Suring, WI 54174.

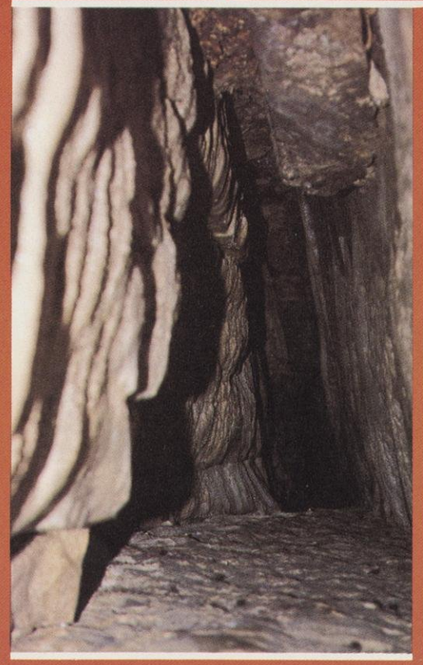
FLOWSTONE CREVICE CAVE



Rimstone dams line the floor of Middle Squeeze. They have razor sharp edges or gours.

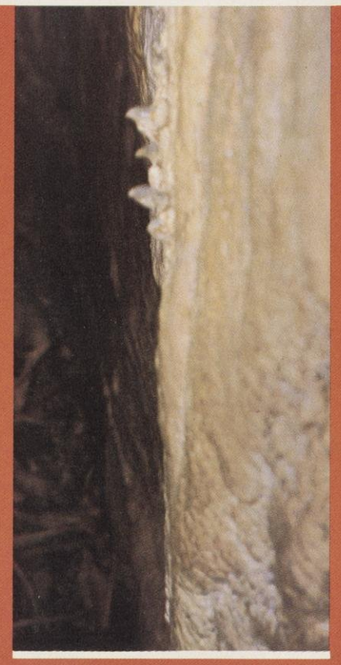


Low water level at the Swimming Pool exposes calcite covered rocks.



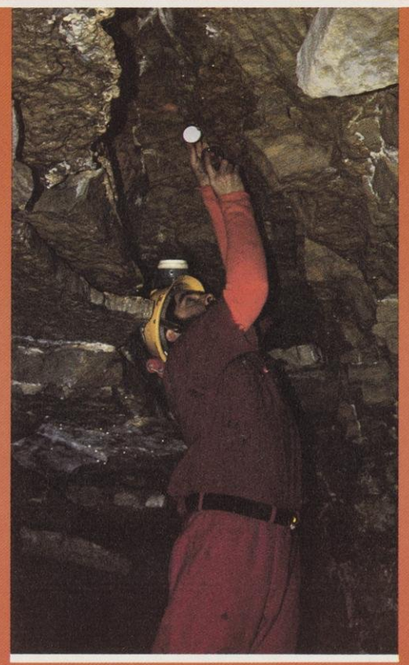
The walls of dead dog chamber.

Skulls piled on top of each other in Dead Dog Chamber.

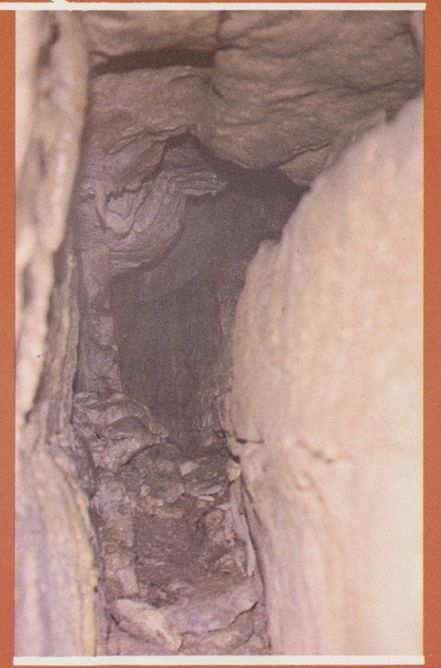


Calcite teeth protrude from the Jaws of Death.

One wall-supported speleothem in the Long Squeeze is more than a foot long.



Norbert H. Kox collects insect specimens to reveal more about the caves he discovers.



Stalactites above and stalagmites below decorate Long Squeeze.

They're Thoreau's "true natives of the soil," and Leopold's "baffling bird." Drumming stakes out male territory, but sometimes can only be explained as purely for pleasure. Photos by Greg Scott

THAT GRAND OLD •PARTRIDGE•

CLAY SCHOENFELD,
Center for Environmental Studies, UW-Madison

Ruffed grouse are the all-American, all-Wisconsin bird. They drum in spring, explode in fall and need cover and bugs when they're young.

The ring-necked pheasant may be an import from China, but the ruffed grouse is a native. Like a feathered Dan'l Boone, he is 100% American. There is even some question whether "GOP" did not originally stand for "Grand Old Partridge." Indeed, the ruffed grouse is found only in North America, where his range is greater than that of any other nonmigratory game bird. I have flushed him from coast to coast, across Canada and into Alaska, and south to Arkansas and northern Georgia. In some places, he is known as woods chicken or mountain pheasant, but these pseudonyms are our invention, not his. Nowhere does the ruffed grouse pose as a secret agent. He announces his presence with enthusiastic drumming in the spring and noisy takeoffs in the fall.

Quail and doves are so groupy and predictable you might accuse them of following some avian party line, but not the grouse. He is the soul of independence. Like a settler who moves on when he can see the lights of his neighbor, the grouse is intolerant of big crowds — human and otherwise. He is no denizen of exurbia. He wants land, lots of land given to trees and undergrowth. Even here, he is rarely found in densities exceeding a bird per four acres. He seldom flocks up. When things get too jammed, he pioneers new territory on early fall "crazy flights," or his population collapses with a dramatic slump.

Geese and ducks require fancy, government-supported habitat, but the grouse is happy to hang out on anybody's back forty. Despite his kinship with the wild, he actually has proven very adaptable, like any good citizen. Being a bird of young-to-middle-aged forests, and having an especial liking for edges and interrupted woodlands, he has been greatly benefited by the younger stages of forest succession which have followed lumbering and fire, and by the patchy openings which are made in the woods by small-scale farming. His greatest numbers are thus not in primeval areas but in regions where there is some human activity, a relationship which is maintained despite a hunter take which runs into the millions of birds nationally each year.

Despite being so widely distributed and so well-known, the ruffed grouse is little understood. Aldo Leopold called him "this baffling bird," because of the extreme difficulty of learning much fundamental about a species that cannot be trapped or banded in quantity and that cannot be bred freely in captivity.

What we do know, however, furnishes some pretty sound clues on how to conserve him. He is a brownish, fowl-like bird about the size of a bantam hen — larger than a Hungarian partridge and smaller than a pheasant. The dark, partially concealed ruff on each side of his neck gives him his name. His fan-shaped tail distinguishes him from his cousins, the sharptail and pinated grouse. The sexes look so much alike that only an expert can tell them apart by the length of the central tail feathers. There are two color phases, red and gray.

The ruffed grouse saga rightly begins in the early spring woods, when there is to be heard that distinctive sound of a feathered motor boat, the drumming of the cock, perched on an old log, beating the air with his wings so fast they appear blurred even on a slow-motion movie. Some drumming is undoubtedly done for the pure pleasure of it. We have had a grouse drum in our woods all night in August during a soft rain. But at heart, drumming has its utilitarian purposes. It serves first to announce to other cock birds that this is private territory. And it summons harem hens to the breeding grounds. Drumming cover, containing one or more logs, must be widely dispersed over the range, because each male exercises complete control over his territory. Where logs are not well distributed, game managers fell them.

Once he has performed his male functions, the cock bird keeps to himself; meanwhile the female seeks nesting and brooding cover. An ideal partridge nursery is a low, dense canopy adjoining openings containing a variety of plant and insect life. Where underbrush is in short supply, it is important that cows be fenced out of the woodlots. On the other hand, where openings are needed, light grazing can actually help produce openings, or they can be built with axe and bulldozer. Nursery cover is of critical importance. It is during the relatively short period when cover is required that we lose approximately 75% of the grouse crop each year.

The hen grouse lays 10 or 12 eggs in a simple ground depression under a rock or at the base of a stump. So long as she is motionless, she is surprisingly secure, because she apparently gives off little scent at this season of the year. I have seen a good pointer pass without pause within a few feet of an incubating grouse. The worst nest marauders are often the squirrels, chipmunks and skunks who accidentally stumble by and sample the eggs.

After three weeks or so, the chicks literally run out of the eggs, fluff off and hide with their mother in the brush, feeding almost entirely on a variety of insects and worms. Cold, wet weather that depresses the bug population in late May or early June thus can have a marked effect on the fall grouse supply. In 10 days to two weeks the surviving

grouse are making short flights. By mid-July, they seek molting cover. Rank growths in moist areas are especially attractive, provided there is a dusting ground nearby. By the time they reach pullet size, young grouse are already capable of a noisy flush.

No sound of the woods is more startling than the thunderous roar of beating pinions with which a partridge rises, sometimes almost from underfoot, scattering the leaves like a whirlwind and tearing its way through rustling branches, winning distance and concealment in one breathless rush, leaving the hiker or hunter staring with open mouth and fast-thumping heart. It is not necessary for the partridge to rise with such bluster, however. He can flush, fly and alight as quietly as most birds.

When he is full-grown, the grouse is primarily a plant eater — leaves, fruits, nuts, seeds, buds and catkins. This diet is the main clue to his likely fall whereabouts — feasting on clover along an old logging road, eating apples in an abandoned orchard, sampling berries in a dogwood thicket, budding birch at a forest edge, scratching for seeds along a woodland path. Except in the years when the population is at an utter low, shooting does not seem to be a serious threat to the grouse population. In general, hunters simply crop part of an ample supply.

With the coming of winter, grouse cover must be of the type that will provide food, protection from extreme weather and roosting places safe from predators. Now is when you find him in a downed hickory, high up in an oak, underneath a young evergreen or even immersed in a snowbank. The most critical point in the adult grouse year is that period between the end of winter cover and the burgeoning of spring growth, when food is in short supply and yet when nature demands the vigorous exertions of mating. It is then that the delicate balance of habitat may tilt for good or ill. The kinds of foods most apt to prove valuable at this critical time are leafy plants such as clovers and strawberry, and species which retain fruits over winter and yet do not grow to a height that exposes these fruits above the snow. They should be planted on south-facing slopes, properly interspersed with the cover.

Regardless of how modern management may raise the average level of grouse abundance, its numbers will apparently continue to fluctuate. Good years will be followed by lean, and lean years by good again. Poor brooding seasons, outbreaks of diseases and great increases in predators have variously been blamed for the grouse cycle, and doubtless they all make their contributions; but the total story is still untold.

There is no mystery, however, about why the grouse furnishes difficult hunting. Eternal vigilance is the price of obtaining a shot. Where the cover is dense, the grouse may disappear in a flash, or there may be only a roar of wings to indicate his presence. In hilly country, as you toil up one slope, the bird careens down the other. Or he may allow you to walk past and then zoom away behind your back. You may find a place where partridge abound one day, and on the next you may hunt the same spot all afternoon and not flush a single bird.

It is fortunate, actually, that the grouse is so difficult a quarry. Otherwise, you would not hear in the March and April woods that sound of distant thunder, the perennial drumming of a partridge cock, fulfilling that fine prophecy of Thoreau: "The grouse are sure to thrive, like true natives of the soil, whatever revolutions occur."

Winter cover needs to provide food, protection from weather and safety from predators. *New Snow* by Artist Jonathan Wilde, Rt. 1, Belleville, WI 53508

By Kathy Kahler, DNR Information Assistant

1985 waterfowl season reduced

DUCKS:

Major restrictions were placed on the Mississippi Flyway duck season this fall. The cutbacks came because of continued drops in mallard and pintail breeding numbers. Mallards fell to an all-time low of 5.5 million breeders this year, down 8% from last year and 35% below the 1955-1984 average. Pintail surveys show a record low of 2.9 million breeders, down 20% from last year and 50% from the long-term average.

Even more significant is the drop in total duck numbers from 38 million in 1984 to 31 million this year. Of 10 major species surveyed, significant decreases were seen in mallards, pintails, gadwalls, shovelers, wigeons, redheads, canvasback and scaup. Only two species — blue-winged and green-winged teal — remained at 1984 levels.

The U.S. Fish and Wildlife Service 1985 season framework has reduced this year's season to 40 days from 50 days last year. Hen mallards were increased to 100-point birds while drake mallards and pintails are now 35. Low point birds will be valued at 20 points this year. The 1985 season cannot open before October 8.

GEESE:

The Fish and Wildlife Service has again assigned 15,000 geese to the Horicon-Central Tag Zones and lengthened the season to 40 days. The 20-day basic season will continue in the remainder of the state except for 70 days on the Mississippi River which coincides with seasons in Minnesota and Iowa.

The fall flight of Mississippi Valley Population (MVP) geese is expected to approach or exceed the 500,000 mid-winter goal this year. The 1984 count found 470,000 MVP geese. Production for 1985, however, is expected to be only fair to good because of late snow storms in the lower Hudson Bay area.

Mandatory hunter education

Starting this year, young hunters born after January 1, 1973, are required to complete hunter education training before they can obtain a hunting license. They will learn safe handling of firearms and equipment; responsibilities of hunters to wildlife, the environment and landowners; and the principles of wildlife management and conservation. **After completing the course, a resident hunter will be awarded a certificate of accomplishment that can be used for one year in place of a small game hunting license.**

People involved in training young hunters believe that the future of the sport is in the hands of nonhunting citizens who make up more than 80% of the population. The general public's image of hunting and hunter behavior will set the course and young hunters who recognize this and act responsibly can be the key to determining what happens.

For information on course registration, contact the law enforcement safety specialist at the DNR District headquarters nearest you.

National hunting and fishing day poster contest winners

Five Wisconsin students won awards for their interpretations of "Why Wildlife Needs America's Sportsmen," the theme of this year's National Hunting and Fishing Day Poster Contest. **Cheryl Ann Vetterkind, Thorp; David Coleman, Balsam Lake; Gina Motz, Balsam Lake; Korey Losey, Athens; and Heather Ann Rock, Readstown, were among 67 national winners.** The contest attracted thousands of entrants from grades 5 through 12.

The purpose of the National Hunting and Fishing Day contest is to encourage students to learn more about conservation and to increase awareness of hunters' contributions to the country's conservation efforts. **Since 1923, hunters and anglers have contributed more than $5-billion through special taxes, license fees and private contributions for fish and wildlife management plus acquisition of millions of acres of habitat.**

Information on how to sponsor or enter the 1986 National Hunting and Fishing Day Poster Contest is available free from NHF Day Headquarters, Box 1075, Riverside CT 06878.

1985 permit deadlines

- **Apostle Islands deer hunt:** received by Lakeshore Supervisor by **August 25.**
- **Canada goose hunt,** Horicon or Central Zone: postmarked no later than **September 15.**
- **Canada goose:** Mississippi Valley Population (MVP) Zone (**counties surrounding Horicon Zone): no deadline;** free permit available about September 10.
- **Canada goose — Theresa Zone: apply in person** at DNR Station, Theresa Wildlife Area between 9:00 a.m. and 4:00 p.m. during the five days before the goose season or between 5:30 a.m. and 3:00 p.m. throughout the season.
- **Hunter's Choice or Antlerless Deer:** postmarked no later than **October 4.**
- **Sandhill Wildlife Area deer hunt:** postmarked no later than **October 4.**
- **Bobcat:** postmarked before **October 4.**
- **Fisher:** received by **October 4.**
- **Otter:** received by **October 4.**
- **Turkey (1986 season):** postmarked no later than **November 1.**
- **Disabled persons** (permit to hunt or shoot from a standing automobile): apply to your local warden **at least 10 days before date of use.**
- **Pheasant hunting on selected properties** (includes tags): apply and receive **any time prior to hunting.**

New hunting and trapping rules

As a result of public hearings and recent legislation, several new hunting and trapping regulations go into effect this fall and are summarized below. Wisconsin citizens are reminded that most rule changes are presented at annual fish and game hearings conducted in each county the fourth Monday in April. Your attendance is encouraged.

• **Closed bear season** — Wisconsin's bear population has dropped below the management objective of 5,500 because of uncontrolled harvests the past three years. The closure occurred because DNR has no statutory authority to control the size of the harvest or the number of hunters who participate in bear hunting. A law to allow this was pursued during the last legislative session. It would have let DNR limit the bear take to 500 and build the population back up to 5,500 by 1988. An annual bag of 700 could then be established.

Despite support from hunters and anti-hunters, the Assembly and Senate could not agree on the type of dog and bait controls to establish for the hunt. Faced with the potential for another hunting season of overharvest, DNR chose to close the season to protect the resource.

Renewed efforts are already underway to get the law changed so the season can re-open in 1986. Sportsmen are encouraged to express their views through their County Conservation Congress representatives.

• **Mandatory hunter education** — Following several years of lobbying by state sportsmen, persons born on or after January 1, 1973, must have a Hunter Education Certificate to purchase any hunting license. Hunting accidents have been declining in Wisconsin as the number of hunter education course graduates increases.

• **Apostle Island deer hunting** — Oak and Basswood Islands, containing 5,078 and 1,981 acres respectively, will be open to muzzle-loader deer hunting October 1-31. This special hunt is especially suited to a wilderness island environment. Only 100 permits will be issued (August 25 deadline) and other hunting on Oak and Basswood will be closed. Madeline and Long Islands remain open to regularly scheduled statewide seasons.

• **Deer Management Unit Changes** — The boundaries of Deer Management Units 54B and 61 have been modified for better hunter distribution. Unit 54B was divided about in half and Unit 61C was created using part of Mississippi River Pool 4 bottomlands.

• **Sharp-tailed grouse closing** — The sharptail season has been closed in the vicinity of the Kimberly-Clark Wildlife Area in Price County to complement extensive habitat management efforts by DNR. The season will be reopened if the sharptail population responds within the next few years.

• **Bobcat carcass collection** — Hunters and trappers registering bobcat are required to turn carcasses over to DNR. The carcass collection effort will enable research to assemble valuable reproduction information.

• **Fisher season opening** — A growing and healthy fisher population has allowed DNR to open a limited season by permit December 1-11. See the Almanac fisher article for details.

• **License increase** — Hunting license fees are normally adjusted every four years; the last increase was in 1983. However, because of legislation on agricultural damage, most hunting licenses increased $1.00 this year.

• **Turkey season modification** — The opening date for the turkey season has changed from the ***Thursday*** nearest April 21 to the ***Wednesday*** nearest April 21. This one-day adjustment allows each five-day hunting period to close on Sunday rather than Monday, making it easier for hunters to schedule vacations.

• **Parks deer hunting** — Increasing deer populations in Wyalusing and Natural Bridge State Parks require a gun deer season to control park vegetation damage as well as agricultural damage in the surrounding areas. Wyalusing will be open to Hunter's Choice permit holders, Natural Bridge to Antlerless Deer permit holders.

• **Volk Field and Ft. McCoy deer gun season** — Military officials establish flexible deer hunting rules each year to make sure crop damage is kept to a minimum in the surrounding area. Hunters should note that firearm use, season dates and bag limit may vary from year-to-year.

• **Expanded deer season authority** — The DNR Secretary now has authority to extend the deer season if the expected harvest is projected to fall short of established goals. Designed to give the agency rapid response capability not possible with the normal rulemaking process, the new authority recognizes the importance of keeping deer populations in balance on farm land. Crop damage has increased to millions of dollars annually in recent years.

New fisher season

Wisconsin's first fisher trapping season in six decades will begin in 1985. Research and questionnaires from northern Wisconsin trappers indicate that fisher populations have increased to a level capable of withstanding controlled harvests. A new law allows DNR to set quotas on the number of trappers who can legally harvest fishers, thereby confining annual harvests of this furbearer to biologically safe levels. Before this year, DNR was authorized to set quotas only for Canada geese, deer and turkey.

The season will run from December 1 through the 11th each year, when fisher furs are most prime and bring the highest price.

A small number of permits will be issued allowing trappers to harvest one fisher per season. **Trapping will be allowed only in locations where fisher populations are high.** The number of permits issued to tribal members of the Chippewa Indian Nation will be determined through negotiations prior to each trapping season. The two fisher closed areas in the Nicolet and Chequamegon National Forests will remain closed to dryland trapping.

Successful fisher trappers must tag the animal as soon as it is taken, as required with bobcat and otter. Trappers should bring pelts, separated from the carcasses, to DNR field stations in the management units where they were trapped or an adjoining unit, no later than five days after close of the season. At that time **carcasses must be surrendered for age, sex, and reproductive studies.** This vital information will be used to keep track of fisher populations to make sure that the number of trapping permits issued stays in balance with fisher reproductive capabilities.

Hunting dog training seminars

In June, DNR and the Wisconsin Association of Field Trial Clubs completed the ninth consecutive year of sponsoring public hunting dog training seminars.

The Wisconsin dog training seminars were developed as a result of a DNR Hunter Ethics Committee recommendation "to encourage the training and use of hunting dogs where legally allowed." The committee reported that, "The use of trained hunting dogs adds a dimension to the sport by involving the hunter in the actual training, as well as the ultimate benefits of a good hunting dog. A new sense of values undoubtedly emerges that enhances the quality of hunting. There are other benefits that accrue, such as reducing unretrieved losses and finding more game."

Studies in Wisconsin and elsewhere have offered proof of an old assumption — that very strong bonds exist between hunters and dogs. A 1979 survey of Wisconsin pheasant hunters by Heberlein and Trent of UW-Madison found that 71% judged "a good dog" to be very important to a good hunting experience. In a followup study in 1981, they found that 65% of those surveyed thought "a dog who does a good job" was "important" and/or "necessary." For those who hunt upland birds or waterfowl with dogs, this evidence comes as no surprise. Anyone who has ever owned, trained and hunted over a good dog would find the mere thought of hunting without one to be unacceptable!

To date, over 3,200 students and more than 4,200 friends and relatives have attended the DNR-Field Trial Club dog training seminars. Persons interested in attending next year's sessions should watch for news announcements next spring or write: Bureau of Wildlife Management, Box 7921, Madison, Wisconsin 53707.

Season dates and outlook

Species	1985 Locations and Dates	Game supply compared to 1984	Hunting prospects
Coyote	Statewide, all year	Improving	Fair to good. Best in north.
Snowshoe Hare	Statewide, all year	Improving	Fair. Best in north.
Turkey	7 units — 3 hunting periods between Apr. 23 and May 11, 1986	Up	Good. Best in southwest counties near Mississippi R.
Ducks	Statewide, dates published about Sept. 15	Down	Fair. Best along Mississippi R. and in east counties.
Canada Goose	Statewide, dates published about Sept. 15	No change	Fair to good. Best in east central portion of the state.
Woodcock	Statewide, Sept. 14—Nov. 17	No change	Good. Best in northern 1/3 of state.
Bear	None	Down	No open bear season in 1985
Gray and Fox Squirrel	Statewide, Sept. 14—Jan. 31	Improving	Good. Best in southern 2/3 of state.
Jackrabbit	Statewide, noon Oct. 19—Nov. 15	No change	Poor. Not abundant in any region.
Cottontail Rabbit	North: Sept. 14—Feb. 28 South: Noon Oct. 19—Feb. 28	Up	Good. Best in southern 2/3 of state.
Ruffed Grouse	North: Sept. 14—Dec. 31 South: Sept. 14—Jan. 31	Improving	Fair to good. Best in western Wisconsin.
Sharp-tailed Grouse	North only, Oct. 19—Nov. 10 (some closures)	No change	Poor. Not abundant in any region.
Raccoon	Residents statewide, Oct. 19—Jan. 31 Nonresidents statewide, Nov. 2— Jan. 31	No change	Good. Best in southwest and west central.
Bobwhite Quail	Statewide, noon Oct. 19—Dec. 11	No change	Fair. Best north of Wisconsin R. in southwest Wisconsin.
Pheasant	Statewide, noon Oct. 19—Dec. 11	No change	Poor to fair. Best in southeast 1/4 of state.
Hungarian Partridge	Statewide, noon Oct. 19—Dec. 11	No change	Fair. Best in counties near Lake Winnebago and Lake Michigan.
Red and Gray Fox	North of Hwy. 64: Oct. 19—Jan. 31 South of Hwy. 64: Nov. 2—Jan. 31	Improving	Good. Best in west-central and southern Wisconsin.
Bobcat	North of Hwy. 64: Oct. 19—Dec. 31	No change	Poor. Not abundant in any region.
Deer	Gun: General Nov. 23—Dec. 1 Bow: Statewide Sept. 21—Nov. 17 Dec. 7—Dec. 31	No change	Excellent in most areas. Best in northeast, central and west central Wisconsin. Trophy opportunities in north.

Stop the Poacher

Report Violations
TOLL FREE HOTLINE
1-800-TIP-WDNR
(847-9367)
24 Hour — Confidential

Deer permit hotspots

High deer numbers and concerns about crop damage have resulted in a dramatic increase in the number of hunter's choice permits to be issued in 1985. Based on previous application rates, there are likely to be surplus permits in some deer management units. Hunters have the best chance of obtaining a permit from this list of units.

Management Unit	1985 Permits Available	1984 Applications	Projected* Surplus
38	2,925	2,191	734
39	2,975	2,735	240
40	3,750	2,451	1,299
41	2,900	2,379	521
43	2,800	2,372	428
50	3,325	2,410	915
51	13,825	9,986	3,839
60	5,175	4,663	512
67B	5,525	5,211	314
70E**	1,775	1,458	317
71**	10,750	8,938	1,812
72	10,975	7,986	2,989
73	8,275	5,462	2,813
75	10,650	4,625	6,025
77A	800	745	55
80	6,050	5,967	83
81	375	256	119

* Assumed no increase in applications.
** Antlerless-only permits.

Hunters are advised to start early in securing a place to hunt. Much land in the above units is privately owned. Most landowners are willing to accommodate hunters, but many will have room only after opening weekend. In addition, all hunters are reminded to get permission before entering private land. Current trespass laws carry penalties of up to $1,000.

Public hunting lands

Looking for a place to hunt? Chances are there's public land somewhere near you. **More than five million of Wisconsin's nearly 36-million acres are open to public hunting.**

In the last three years, wildlife managers have added over 15,000 acres to lands leased by DNR as public hunting grounds. Under the lease program, private landowners receive an annual payment for hunting rights. No other recreational activity is allowed without the landowner's permission.

Maps of most public lands open to hunting are available at your local DNR office.

Public Land in Wisconsin

Titleholder	Acres
USA	1,684,955
DNR	1,000,000
County	2,320,663
Trust Lands	85,498
TOTAL	5,091,116

Special pheasant hunting rules

Wisconsin's experimental effort to provide improved pheasant hunting in 1984 was successful and will continue this fall. **Hen pheasant hunting requires a permit obtained from most DNR license outlets and some county clerk offices.**

The hen stocking program makes more effective use of some of the surplus hen chicks produced by the State Game Farm. The 2:00 p.m. closing allows DNR to do a better job of stocking game farm pheasants during the first two weeks of the open season when hunting pressure is highest.

Contact your local DNR office for a map of these special use areas.

Hunting license fees

Sports License — $27.00
Conservation Patron — $100.00
Resident Small Game — $8.50
Resident Deer — $13.00
Resident Archer — $13.00
Trapping — $12.50
Turkey Stamp — $11.75
Nonresident Small Game — $61.50
Nonresident Small Game (5-day)—$31.50
Nonresident Deer — $86.50
Nonresident Archer — $66.50
Nonresident Furbearer — $126.50
Waterfowl Stamp — $3.25

Conservation Patron license

Wisconsin hunters and anglers again have the opportunity to purchase a convenient all-purpose license. **The $100 Conservation Patron License covers small game and deer hunting (including archery), trapping, fishing and sturgeon spearing. It also eliminates the need to purchase state waterfowl, inland trout and Great Lakes salmon and trout stamps.** Stamp collectors who want the actual stamps will have to buy them separately.

Included with the wallet-sized card is a carrier for special permits and stamps such as the federal migratory bird and state turkey stamps, and bobcat, otter, pheasant and sturgeon permits. The cardholder also receives applications for hunter's choice and goose hunting permits, registration stubs for deer, an annual state park admission sticker, and **a year's subscription to *Wisconsin Natural Resources* magazine.**

The Wisconsin Conservation Patron License is valid from September 1 through August 31. Applications can be obtained at county clerk's offices and DNR field stations or sport shops. Purchases may also be made at certain DNR field stations. For more information contact: DNR License Section, Box 7924, Madison, WI 53707.

Checklist for the responsible hunter:

1. Do you always make sure the muzzle of your gun is pointed in a safe direction?
2. Do you always treat your gun as if it were loaded and ready to fire?
3. Do you always load your gun only while actually hunting and keep it unloaded and open at all other times?
4. If hunting with others, do you always know your safe zone of fire and the location of your partners?
5. Do you always make absolutely sure of your target and what's beyond it before you shoot?
6. Do you always limit your shots to those within range?
7. Do you always make every possible effort to recover game?
8. Do you always make sure to leave gates the way you found them?
9. Do you always make sure to pack out all of your litter?
10. Do you always wear a hunter orange vest or coat and cap, if appropriate for your type of hunting?

Reader's Write...

A recent "Readers write" letter writer was burned up about no hunting and no trespassing signs put up by landowners. Well, as a landowner in Wisconsin, I don't think he has any business telling us landowners what we can and cannot do on or with our own property.

Not all of us are hunters, and I for one am not going to allow anyone to set up a blind or tramp around my grounds with a game plan of get that deer.

I pay my taxes, and I want my property to do with as I want. My no trespassing signs mean just that.
Mrs. L. Wojcik, Downers Grove, IL

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The reason some of those no hunting signs are posted is because of some "klutz" who is careless with his gun. A few years ago, I was sitting in front of my living room window when a bullet went into the wall of my house about two inches from that window at a level with my eyes.

I had to buy my land, and I will post it if I like. I realize some hunting is good, so our animals and birds do not overpopulate, but I do think it is overdone.

I love my wildlife friends. I will protect them in every way I know how. I feed them all winter, but make them hunt their own in the summer, so they don't get too dependent on humans. I have the most wonderful variety of birds the year round.
Mrs V.A. Schuh, Cuba City

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Recently, a reader suggested that I as a citizen and private landowner should have to allow hunters onto my land. I should be able to forbid hunters only if the hunter, the owner or property would be endangered.

Something is overlooked in this—some of us citizens oppose hunting of the sort engaged in presently and generally in Wisconsin. And we have the right and privilege to "no hunting." I am convinced that we must protect anything that has some element of the "natural" left within it.

There is a common bond between hunters/anglers and people like me—and from a practical point of view I support the efforts that are made to preserve wildlife habitats, even if part of the motivation is for hunting/fishing. I think that the real issue is not "to hunt" or "not to hunt," but an underlying and essential attitude toward the earth—and not just as users of the earth.
Kenneth Maly, Ettrick

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We are not Wisconsin residents, but spend a good deal of time there and were disappointed to read in your magazine that the Ahnapee Trail may be closed to bicycling.

We strongly disagree with Conrad Amacher of Wisconsin Rapids that this trail is poorly maintained. We rode the same stretch—from Maplewood to Sturgeon Bay—just this past summer and found it in excellent condition for a crushed stone bike trail. As a matter of fact, we prefer this type of trail to the more populated, paved bike paths.

Can anything be done to keep the Ahnapee Trail open for bicycling?
Roger and Karen Debenham, Chicago

The Ahnapee Trail is very expensive to properly maintain for bicycling, has limited use by the public and presents some serious management problems due to many crossings. So, DNR considers the best present use of the trail is as a hiking and berry picking nature trail in summer and a snowmobile route in winter. Changing technology and trends may place a different emphasis on this property in future years.

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I was horrified by the prejudicial photo of a brown bat appearing on page 13 of your special picture edition.

Brown bats are beneficial mammals that among other things make a significant contribution to our environment by consuming prodigious quantities of mosquitos and insects. Wisconsin bats are very intelligent, lovable, social creatures.

But bats suffer from a bum rap by being depicted as voracious nasties that bite and spit and hide in women's hairdos. Your photo dramatizes this misconception rather than "exuding reality."
Burton Clark, Wauwatosa

The magazine likes bats and has carried several stories about the good things they do. But this was a photo issue, and it was a good picture. Beauty, as they say, is in the eye of the beholder, even if it's a little horrifying.

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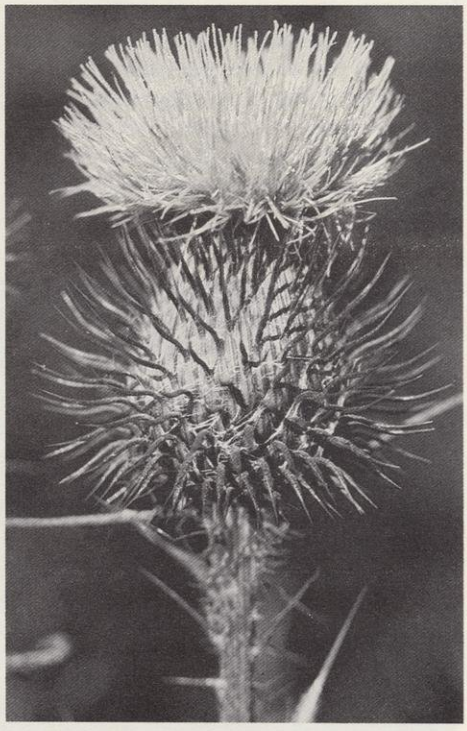
I know it was a while ago, but I believe a picture was mislabeled in the January-February issue on page 11. This should be nodding or musk thistle (*Carduus nutans*) not Canada thistle.
Herbert H. Hadow, Milton

Yes. The photo you referred to focuses on the thistle's flower head, which as in all thistles is made up of many small flowers that appear to be a single one. Just below the flower head and just out of focus in this picture are large bracts. They are barely visible in silhouette above the stem, but because these modified leaves are large enough to be seen at all at the angle this photo was taken — the thistle-wise reader, like yourself, can recognize nodding or musk thistle which has the large bracts. The bracts of Canada thistle are smaller and would be hidden by the flower head in such a straight-on photo.



Large bracts below the flower head on bull thistle. **Photo by Mark Wallner**

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While most of the acid rain articles presented factual material and recognized that additional research is needed to understand the impact of acid deposition, you could not resist the temptation to editorialize on page 16. The photo of the Mosinee mill is included, with a caption identifying Wisconsin paper industry emissions of sulfur dioxide.

The caption is accurate, but the photo is a gross misrepresentation of the current operation of the Mosinee mill. The photo was taken in 1975, one year prior to completion of a $23-million air pollution abatement project at the mill and shows an obvious particulate haze from a stack that was retired from operation in November, 1976—eight full years ago. The project at Mosinee was exceptional enough to be awarded the American Paper Institute's Environmental Improvement Award for the most outstanding pulp and paper industry air pollution control project in the entire country that year.

I am enclosing an aerial photo of the Mosinee mill as we currently operate.
James S. Albrecht, Mosinee Paper Corporation technical director

Sorry we had an outdated picture of Mosinee in our files. Contrary to your accusation, there was no intent whatever to editorialize. Of course, your firm is to be commended for its cleanup efforts. I well remember that for many, many years, everytime I drove up highway 51 in the vicinity of Mosinee, the aroma pervaded for miles and miles. Everyone was pleased when it stopped. We will indeed put this new picture in our files and toss out that old one. Thanks for sending it.

We hear a lot about acid rain, but no one seems to mention the dumping of an herbicide every spring into Long Lake at Dundee in Fond du Lac County to kill off certain weeds.

Last year when we went fishing, fumes could be smelled around the boat, and that's how we knew that the lake had been sprayed. Where were the signs to warn that for up to three weeks after the spraying fish should not be eaten, swimming is not recommended and lake water should not be used on gardens? We found an inconspicuous one on a boat house.

The Long Lake property owners have a contrivance to remove weeds from the shore lines. I have never seen anyone using it. The Long Lake fishing club maintains that there is a scarcity of walleyes in the lake.

Can you help stop the spraying?
A. Cline, Milwaukee

DNR is presently reviewing the Aquatic Nuisance Control program on a statewide basis. With few exceptions, all herbicide applications to lakes and streams must be approved by DNR.

Most herbicides that are approved for surface water application are organic chemicals which break down into less harmful substances. In almost all cases, fish do not absorb or retain these chemicals.

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Congratulations on an outstanding magazine treatment of the acid rain story in your state. As you are well aware, we in Minnesota face similar problems.
Darby Nelson, Minnesota state representative

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This is in reply to both the article "Trapping: a benefit to Wisconsin" and to the antitrapping letter from Mr. Kostohrys:

Trapping, like hunting, is under fire today by many people who believe it is cruel to kill animals. Their beliefs are often based on emotions and feelings. They think it cruel to hold an animal in a trap until the trapper arrives or to shoot an animal. They consider animals as individuals with ethical and moral rights.

Protectionists are not necessarily conservationists. Conservationists believe in the management of resources for sustained use. Protectionists have a dream that through total protection, Mother Nature will manage the resources. Mother Nature has hard methods, e.g., disease, plagues and starvation, for establishing balance. As man's activities, especially habitat alteration, encroach on nature, the balance is upset. Man has the ability to adjust his own influence on this balance through the science of wildlife management.

Trapping is an indispensable tool of wildlife management. Wildlife must be managed for the health of the animals, for proper use of other resources and to minimize any conflicts between man and animals. To manage wildlife, biologists study animals' habits and then determine how many animals the land will support. When a surplus exists, extra animals can be harvested. Trapping has proven to be one of the most effective, economical and efficient methods of harvest.

As a form of outdoor recreation trapping is unique. It requires skill, knowledge of and respect for fur bearers, physical and mental effort — and is one of the few recreational forms which offers some financial return.
Ron Klebs, Wisconsin Trappers Association president

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WISCONSIN'S MILKWEEDS

WILLIAM G. LAINE, Menomonie

Bursting milkweed—common as children's wishes on the wind. Photo by author

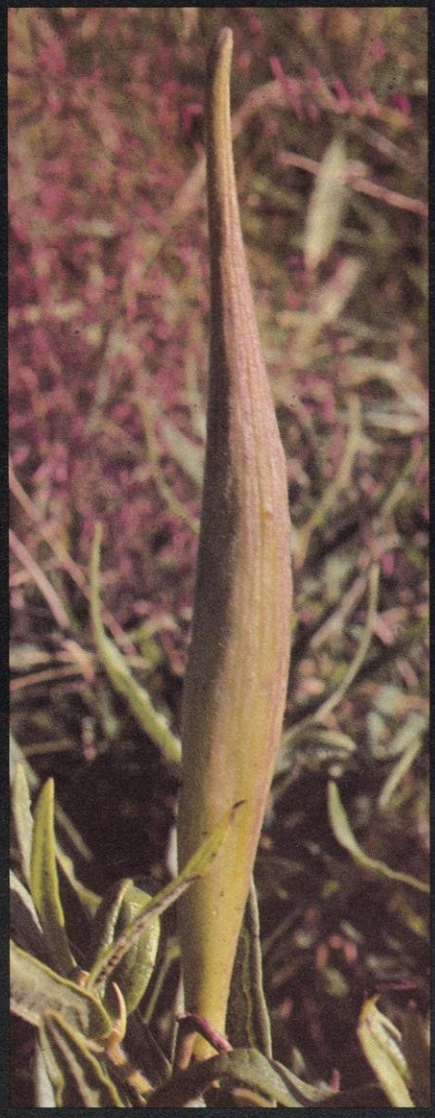
Milkweeds nourish the monarch butterfly, and its downlike seeds sail the wind in fall. There are 13 different kinds in Wisconsin. One has disappeared.

Not many stop to admire the common milkweed, *Asclepias syriaca*, when it's in bloom. Its dull purplish-brown or off-white clusters of flowers, big, coarse leaves and homely odor of cheap rouge just don't attract like the superstars do. And it's commonplace too, along pastures, roadsides, corners of cornfields and waste places. It colonizes them by by sending pilgrim seeds sailing. Then it forms clones and spreads by vegetative propagation through shallow root systems sometimes 15 feet long. But though nondescript, it's as famous as Lincoln's log cabin because a celebrity, the monarch butterfly, is born and raised on milkweed leaves. Milkweeds contain cardiac glycosides, related to digitalins which are used to treat some heart disease. When the monarch larva absorbs these glycosides, it and the adult butterfly become toxic to birds and other predators. Poison to some is medicine to others. The genus was named in honor of Aesculapius, the Greek god of medicine. The root of the butterfly-weed, Asclepias tuberosa, was chewed by Indians as a cure for pleurisy and other pulmonary illnesses. Some Indians rubbed

the juice on warts; women drank an infusion of the rootstock as a contraceptive. It is said to have diuretic, emetic and purgative properties and to treat dropsy, water retention, kidney problems, asthma, stomach troubles and gallstones. ■ The young shoots, newly opened leaves, unopened flower buds and young pods may be eaten—if they are immersed in several boiling waters to remove bitterness. ■ The pods, bursting with silken-tufted seeds, dazzlingly white in sunshine, give even the common milkweed its days of beauty. Despite Emerson's judgment that "beauty is its own excuse for being," people have put the fluff to various uses. During World War I, it was used in life preservers on ships when the foreign fiber, kapok, was unobtainable. Children were paid a penny for every pod they collected. Early white settlers used the fluff to stuff pillows and mattresses. Sioux Indians used it to staunch wounds and for menstrual pads. ■ Indians considered the milky juice to be a "signature" and used it to treat faulty lactation in squaws. Its stickiness served white settlers as glue. It was tested in the search for a source of rubber. The stem is a good fiber substitute. The wide, shallow root system is a valuable soil anchor, and the plant is being considered as a source of alcohol for gasohol. ■ There are about 2,000 species in the milkweed family, a great many of which grow in the tropics and subtropics. Species native to northeastern and northcentral North America are estimated at 30 to 37. All share an elaborate, ingenious beauty of design in their flowers: five curved-back petals reflected by the sepals, a five-parted cup with five horns curving onto five united stamens and all parts joining at

■ *Butterfly weed grows from one to two feet high and blooms June through September. Photo by author*

■ *Monarch larva absorb glycosides from their milkweed meals and thereby become toxic to predators. Photo by John R. Baker*



■ *The monarch butterfly lays her eggs on milkweed leaves. Photo by author*

■ *Butterfly weed pods appear after summer blooms and are about four inches long. Photo by author*

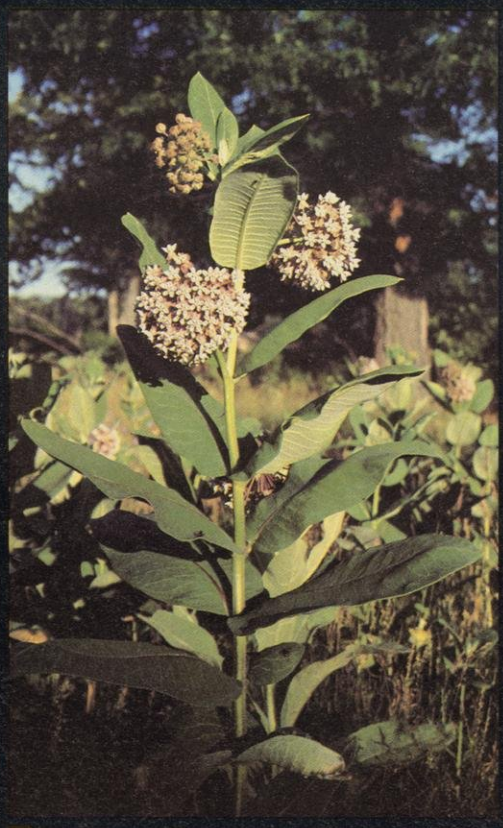
Mead's milkweed is extirpated from Wisconsin prairies and nearly extinct nationwide. Photo by Kitty Kohout

A bee may escape the whorled milkweed's sticky glands, but not without being laden with pollen. Photo by author

the base of the two ovaries. Insects' feet slip into clefts at the base of the flower, thence to slots at the bottoms of which are notched, sticky glands holding pairs of pollen masses. Large insects such as butterflies and bumblebees escape with pollen caught on their feet. Honeybees and flies may be trapped to be attacked by ants, beetles or spiders, or to be drowned by rain. If the flowers were not difficult to pollinate, the stems would be burdened down with many seed pods. ■ Wisconsin has 13 different species of milkweed. An additional one, Mead's milkweed, *Asclepias meadii,* is extirpated from state prairies and nearly extinct nationwide. Generally, the more attractive species are rarer, at least partly because they cope less well with people. ■ Among Wisconsin species, swamp milkweed, *Asclepias incarnata,* has deep pink flowers and graceful, lanceolate leaves. It depends for existence upon the wetlands which farmers and developers are so fond of draining. I find them along rivers, sedge meadows and ponds, blooming from mid-June into August. ■ Butterfly-weed, *Asclepias tuberosa, has* brilliant orange flowers and slender leaves. It reaches a height of only one or two feet. Its juice is watery, not milky like the rest of the milkweeds. Although they are common in some areas, I find them in only one place—during the first half of July at a "T" where two country roads meet. Every year, they are mowed down before they can produce seeds. The small colony endures only by vegetative propagation from its roots. ■ The dainty whorled milkweed, *Asclepias verticillata,* has white flowers and grows about six to 15 inches high. Its size and unusual leaves like pineneedles make it difficult to

find or recognize as a milkweed. These two, I'm told, are very common in some places, but the only ones I know took me several years to discover along the road where we live and walk daily. At the end of July, I photographed some—just minutes before the township's mower arrived. It left none to produce seeds. And none of my pictures came out either: the film had slipped from the winder.

Common milkweed pods appear after summer blooms and are about three inches long. Photo by author

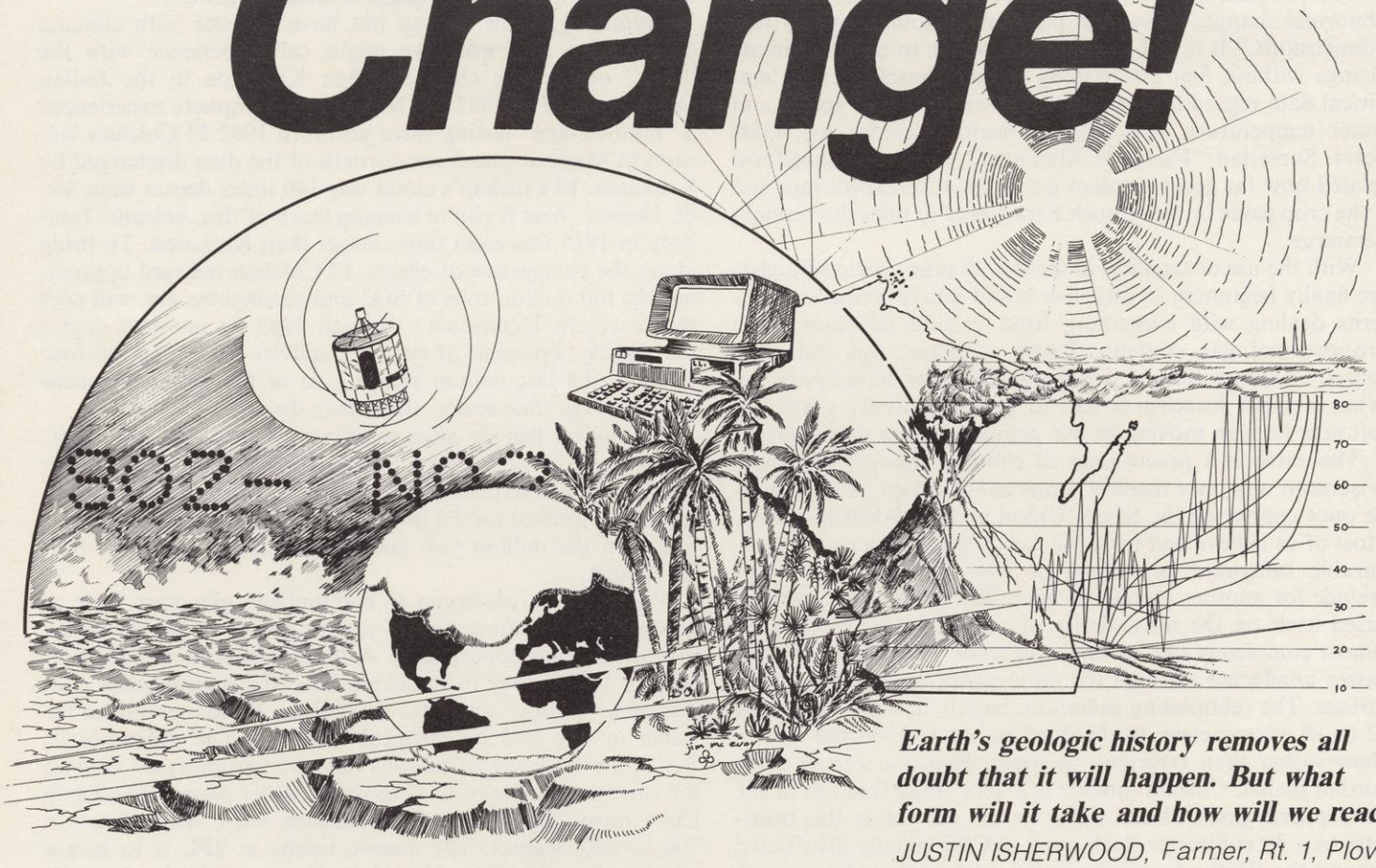


Common milkweed grows from three to five feet high and blooms June through August. Photo by author

Swamp milkweed pods appear after summer blooms and are about three inches long. Photo by author

Swamp milkweed grows from two to four feet high and blooms June through August. Photo by author

Climate Change!



Earth's geologic history removes all doubt that it will happen. But what form will it take and how will we react?

JUSTIN ISHERWOOD, Farmer, Rt. 1, Plover

Revelations of a chemical planet

Any two tourists standing at the foot of Roche A Cri, Eagle Bluff or Rib Mountain share a consistent view of climatic change. That it once was. That the periods of great upheavals are over. That all the rude jealous geologies of earth are settled, polite and changeless. History to such perspectives is the sole prerogative of human action, technology and politics.

The spectre of climate change has been an awakening for the human community and our perception of the planet. It should not have been. Geology has preached climate change to every stone-kicker, every school child, rock climber, lapidarist and engagement ring. Around us is the written legacy of impermanence, of ice ages, volcanism, plate techtonics, the rise and fall of continents and whole kingdoms of species stranded on the shore of the Cretaceous. We know of change in our physiology and the protruding spines of geo-history; yet not in "written" history have we experienced the dislocations of "immaculate" climatic change.

Its last indelible event occurred 20,000 years ago during the melt of the continental glaciers when human population numbered less than a million. It is difficult for the human viewpoint to visualize or accept the total displacement of all we consider the natural standard.

In 1982-83 the El Nino current, named by the Spanish for its typical advent at Christmas time, enacted a simple recurring drama where the deep warm trough of west Pacific water spreads across the entire width of the equatorial ocean. As a result, wetter conditions prevailed on the east where typically it is dry and just the opposite for the west end of the El Nino. The shift resulted in torrential rains in Peru, severe drought in Indonesia and Australia. Massive sea damage occurred along the California coast and flooding in Louisiana. In a moderate tally, El Nino destroyed ten billion dollars worth of property, contributed to the death of 1,100 persons and forced evacuation of 600,000 others. Yet El Nino is natural, it is not in true sense climatic change. The span of occurrence is approxi-

mately five years and it has been known for 300. So El Nino belongs in a classification which is neither rigid norm nor climatic alteration. Rather a cycled weather pattern which, over extended observation, is sequential.

Climate change is an exception to the norm. When graphed, it is statistically separable in both extent and impact, but predictions about it are rudimentary. While climatic change has a continual record, we have not had the chance to observe it as a technological agent and so make reliable judgments of what is going to happen, and where.

The problem is how to differentiate normal changes from abnormal changes in weather patterns without knowing their "dimensions." It is not objectively possible to discuss climate change without first establishing climatic baselines. The empirical data regarding temperatures, rainfall, wind speed, and water temperature have been a healthy science for 4,000 years. Sumerian "Farmer's Almanacs" written in cuneiform related how far apart to plant grain, when to expect rain and if the crop came in, how much barley beer to offer the resident demiurge.

With the use of satellites in the last 20 years, meteorologists are finally beginning to establish broad sets of numerical patterns dealing with everything from ground temperature to proportional gas content. Taken together, this data has caused an integration of world climate never before possible. What weather forecasters had to guess at twenty years ago can now be seen moving in live action across a video screen.

The earth is a practitioner of climatic change. We know Wisconsin was once tropical, same as Antartica. A wide prairie once connected the Soviet Union and the Alaskan coasts. Most of us believe and trust the word "once" is a compelling, durable safeguard protecting us from the fate of former prelude for another glacial advance. The greenhouse scenario based itself on the nifty ability of carbon dioxide to absorb almost completely the infrared spectrum. Light from the sun passes unaffected through the atmosphere until it warms the surface. The rebounding radiation, largely in wave lengths of 12 to 18 micrometers, is absorbed by the CO2 in the atmosphere rather than returning to space. Hence a warmer than normal planet. Carbon dioxide is a very small fraction of the atmospheric gases, about .03%. In one pure layer this translates to a 30 millimeter thick crust of CO2 equally distributed around the Earth. As can be noted, carbon dioxide is a very effective radiation blanket and small amounts greatly modify solar interception.

In 1983 both the Environmental Protection Agency and the National Research Council agreed the Earth was due for a major warming in the scope of two to eight degrees Centigrade global annual mean temperature. The change sounds insignificant at face value, yet a two degree decrease is all the differential assumed necessary to initiate an ice age. The cause of the CO2 build-up is believed the result of the conversion of Mesozoic mineralized carbon into free oxidized carbon. In simpler expression, the burning of oil and coal deposits for energy.

The problem is the Earth is thermo-lastic, not thermo-rigid. Small increases or decreases in temperature radically affect world climates creating weather events whose disassociations and effects are without precedence or forecast.

Climatic change happens to every species if it lives long enough to survive ordinary climate. Studies indicate the Earth is susceptible to a wide array of "cycles" with meteorological consequences. Though these cycles in themselves seem "predictable," the span of time necessary to confirm the thesis is yet beyond our capacities. For example, every 1,250-million years the planet returns to zero degrees obliquity. The result is uniform sun-exposure. This, some believe, is the time-span of Antartica's tropical season. Another cycle of 300-million years points out the circulation of the local-star-group within the arms of the galaxy; this dust-lane passage could be responsible for a variety of planetary changes. A curious statistical pattern of taxonomic excitement arises every 32 million years for as yet unexplained reasons, as if evolution throws a party every so often to break the old goblets and refurbish other antiques. Some think this is caused by a "dark twin" of the sun whose convention every 32 million years caused cometic abnormalities and massive meteor showers.

Humanity, while it may not have practice with climatic change, has had what we might call experience with the "toys" of climatic change. When Krakatoa in the Indian Ocean erupted in 1883 the Northern Hemisphere experienced a "mini-ice-age" lasting three years. In 1982 El Chichan volcano in Mexico vented one-fortieth of the dust discharged by Krakatoa. El Chichan's cloud was 140 times denser than Mt. St. Helens'. And if you're keeping track of this, volcano Tambora in 1815 was eight times larger than Krakatoa. To bring along the perspective of effects, El Chichan released approximately 100 million tons of SO2 and predictions are, will cool the Northern Hemisphere through 1985 by one-half degree Centigrade. Episodes of volcanic activity have recurred four times in the last million years. Two of the episodes concur with Ice Age time scales, the others do not.

Geological history gives warnings of the EPA and NRC some degree of perspective. Still we tend to find little comfort in normalcy as expressed in million and billion year cycles. GNP, the interest on T-bills and foreign debt are out of their league in the million year economy of a thermo-lastic, AC-DC planet.

We have not yet begun to comprehend planetary scale as imposed on human scale and what it means to our cherished institutions and conceptions. Astrophysicists at the Jet Propulsion Laboratory in Pasadena have for several years conducted a "hobby" amongst themselves. Venus resembles the Earth in size and in chemical make-up. The difference is, Venus for a variety of reasons has not "progressed" beyond the tortured mantle of CO2 as did its sister planet. The Earth has a hospitable 50 degree Fahrenheit norm while Venus is 700 to 800 degrees. The cosmic hobby at JPL is to invent schemes by which the Venusian climate might be domesticated. The scale is a thousand years, the tools are microbes, photosynthetic organisms and genetic hybrids capable of reproduction and photosynthesis while floating in the upper sun-rich layer of atmosphere.

The possibilities are taken seriously enough so that various international groups have established guidelines before planetary entrepreneurs can begin converting the original wilderness of neighbor planets. This sense of "missionary zeal" led to careful sterilization of the Viking Mars lander as well as craft designed to touch down on the Moon.

Climate change is a problem of perspective. Perhaps a test of our humor. Should the greenhouse effect take place as predicted, the Arctic ice-sheet could break up and allow for an old wish to come true, the genuine Northwest passage from the Atlantic to the Orient. Some scenarios foresee New York City with winters like Daytona Beach and Illinois trading the corn-belt for citrus production. No more struggles with cold morning cars, snowshoes, skis, ice fishing, or northerners' continual battle with heating bills.

The world's food supply is tied to sun and climate.
Photo by Al Hillery

Despite the evangelists' claim, "Good News" is not necessarily good for everyone. As you might have surmised when it comes to climatic change, there are other cards in the deck. If sea levels rise the predicted six to eight feet due to melting of arctic ice, much of Florida could be under water, and Wall Street and London, a fair share of Japan, China and Taiwan, and the Venice tour will need scuba equipment. Still, that is only the semi-bad news. A warming of two to eight degrees Centigrade could greatly increase insect populations, shift weather patterns, and displace rainfall and cloud cover with possible catastrophic effects on regional agriculture. The nightmare aspect of the EPA-NRC report is their conclusion that little could be done to affect the impact of the greenhouse effect—including such drastic measures as a total world ban on coal burning or a 300% tax on all fossil fuels. On face value there seems no escaping the "sweat-shop's cometh."

Every prediction has its critics. After all, when this is over someone has to be right enough to say, "Na, na, I told you so." Some scoffers believe the computer model of planetary weather is too unsophisticated to offer a reliable picture of "Grand Atmospherics." That too little is known or understood about the complex interweave of industrial inputs, disassociated wind patterns, enhanced photosynthesis, the "step-down" of light reception, albedo, chemical take-up or oceanic interface to draw a reliable conclusion. Their ace in the hole is another Krakatoa swelling toward the bud stage.

There would not be much of a debate over climatic change if we could detach ourselves from the negative aspects it has on human survival. The word survival here has more relevance than a casual interest the industrial world might give it. The risk is the fate of billions of people disinherited and perhaps doomed by even minor swings in climate. This is where it enters the most terrifying of scenarios. Of poor nations pushed beyond the brink. Of industrial nations so internally threatened as to be without extra resources to aid the third world. Mixed with the politics of a thermonuclear briarpatch, climatic change has the potential for demoting Homo sapiens to homo insciens.

The problem isn't CO2 or climatic change, the problem is the reverberations; the echoes are what scare us.

What can be done? If climatic change cannot spur humanity into looking at itself as a single cooperative group, then we might as well throw charity out of our languages and get on with our personal self-interested dooms. We live on a chemical planet. Changes have brought forth the Ages. Chemistry placed the Triassic atop the Permian and the Cretaceous over the Jurassic. Chemistry spent 3,500-million years slowing a planet, evolving atmospheres and nesting biological. We are

Will all of Wisconsin become habitat for the prickly pear cactus?
Photo by Richard C. Vogt

by necessity in the position of managing the planet for the continued health and well-being of all living molecules, some of which are the human type.

The crux of the problem falls on the shoulders of the industrial nations whose use and exploitation has largely contributed to the present situation. To what degree can we stabilize our chemical patterns? For example, can the tropic forests of the equatorial regions buffer the CO2 build-up through photosynthetic conversion to fixed carbon? What do the land-clearing practices as followed in Central and South America contribute to climatic change? Might new patterns of wealth-sharing as a right of local peoples to live "able lives" without hand-outs, manipulation or ecological ruin bring back the tropical "carbon-sink"? What responsibility do the religions of the world have in the management of human numbers where change can be dealt in less than apocolyptic terms? What risks might it be necessary for industrial nations to chance to maintain the broadest and best human condition in times of dislocation? If we knew that a 50% reduction in electrical power production could put off the greenhouse effect for 10 years, would we?

Climatic change is not only a question of Earth and chemistry, it is a perusal of the human heart.

Back cover:
Influences from the heavens can change our climate. These are the northern lights and great dipper as seen through a special camera lens.
Photo by Jeff Peronto

Will the sun's "dark twin" throw out the old goblets after 32 million years?
Photo courtesy of Jerry Erdmann, UW-Madison Photo Media Center

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